"Philofluid" turbulent flow database

PHILOFLUID DATABASE
(in completion)

Contents

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1 2D Shearless mixing

1.1 Grid 1024^3, $E_1/E_2 = 6,6$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → root disk
– **PoliTO - DIMEAS**, Computer "dns3", disco 2

Address:

`130.192.25.60/2D_Mixing/Data/EE66/`
`130.192.25.49/DATA_SHARED/2D_Mixing/1024/LAURIS/EE66/`

Sise: 4 Gb

1.2 Grid 1024^2, $E_1/E_2 = 12$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → root disk

Address:

`130.192.25.60/2D_Mixing/Data/EE12/`

Sise: 4 Gb

1.3 Grid 1024^2, $E_1/E_2 = 40$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → root disk
– **PoliTO - DIMEAS**, Computer "dns3", disco 2

Address:

`130.192.25.60/2D_Mixing/Data/EE40/`
`130.192.25.49/DATA_SHARED/2D_Mixing/1024/LAURIS/EE40/`

Size: 80 Gb

1.4 Grid 1024^2, $E_1/E_2 = 300$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → root disk

Address:

`130.192.25.60/2D_Mixing/Data/EE300/`

Size: 80 Gb

1.5 Grid 1024^2, $E_1/E_2 = 10^6$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → root disk

Address:

`130.192.25.60/2D_Mixing/Data/EE10_6/`

Size: 80 Gb

1.6 Grid 1024^2, $E_1/E_2 = 6,6$ $\ell_1/\ell_2 = 1$, passive scalar $Sc = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie B → usb disk B1

Address:

`130.192.25.166/Lacie (usb)/scalare_passivo/2Dscalar/PASS/SCHMIDT_1_EE66/`

Size: 80 Gb

1.7 Grid 1024^2, $E_1/E_2 = 1$ $\ell_1/\ell_2 = 1$, passive scalar $Sc = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie B → usb disk B1

Address:

`130.192.25.166/Lacie (usb)/scalare_passivo/PASS/SCHMIDT_1_EE0/`

Size: 80 Gb

1.8 Grid 1024^2, $E_1/E_2 = 1$ and 10^4, $\ell_1/\ell_2 = 1$, lagrangian particles

Physical collocation:
– **PoliTO - DIMEAS**, Computer "dns3", disco 2

Address:

`130.192.25.49/DATA_SHARED/2D_Mixing/1024/LAURIS/LAGRANGIAN/`

Size: 80 Gb

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2 3D Shearless mixing

2.1 Data $Re_\lambda = 45$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **CINECA**, iCFD database
Address:

`130.192.25.60/Disco2/Re45/E6_L1/`

Size: 5 Gb

2.2 Data $Re_\lambda = 45$, $E_1/E_2 = 40$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **CINECA**, iCFD database
Address:

`130.192.25.60/Disco2/Re45/E6_L40/`

Size: 5 Gb

2.3 Data $Re_\lambda = 45$, $E_1/E_2 = 40$ $\ell_1/\ell_2 = 0.6$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2

Address:

`130.192.25.60/Disco2/Re45/E40_06/`

Size: 5 Gb

2.4 Data $Re_\lambda = 45$, $E_1/E_2 = 100$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **CINECA**, iCFD database
Address:

`130.192.25.60/Disco2/Re45/E100_L1/`

Size: 5 Gb

2.5 Data $Re_\lambda = 45$, $E_1/E_2 = 300$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **CINECA**, iCFD database
Address:

`130.192.25.60/Disco2/Re45/E300_L1/`

Size: 5 Gb

2.6 Data $Re_\lambda = 45$, $E_1/E_2 = 10^6$ $\ell_1/\ell_2 = 1$, domain 4π and 8π

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **CINECA**, iCFD database
Address:

`130.192.25.60/Disco2/Re45/E10_6_L1/`

Size: 10 Gb

2.7 Data $Re_\lambda = 45$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 0.6$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **PoliTO - DIMEAS**, Computer "avdotia2"
– **PoliTO - DIMEAS**, CD "B128"

Address:

`130.192.25.60/Disco2/Re45/E6_L06/`
`130.192.25.141/home/michele/cubo/B/`
`CD: B128`

Size: 5 Gb

2.8 Data $Re_\lambda = 45$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 1.5$

Physical collocation:
– **PoliTO - DIMEAS**, Computer "avdotia2"
– **PoliTO - DIMEAS**, CD "S128"

Address:

`130.192.25.141/home/michele/cubo/S/`
`CD: S128`

Size: 5 Gb

2.9 Data $Re_\lambda = 45$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 2.1$

Physical collocation:
– **PoliTO - DIMEAS**, Computer "avdotia2"
– **PoliTO - DIMEAS**, CD "C128"

Address:

`130.192.25.141/home/michele/cubo/C2/`
`CD: C128`

Size: 5 Gb

2.10 Data $Re_\lambda = 71$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Computer "avdotia2"

Address:

`130.192.25.141/home/disk4/cubo/prova256_omp_sp/omp170_340/`

Size: 25 Gb

2.11 Data $Re_\lambda = 150$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **CINECA**, "cart" tape archive, user "miovieno", dir. "scal150"

Address:

`130.192.25.60/Disco2/Re150/E6_L1_R150/`
`Cineca: miovieno//cart//scal150/ file: s150_u*.tar`

Size: 400 Gb

2.12 Data $Re_\lambda = 150$, $E_1/E_2 = 1$ $\ell_1/\ell_2 = 1.5$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2

Address:

`130.192.25.60/Disco2/Re150/E1_L15_R150/`

Size: 350 Gb

2.13 Data $Re_\lambda = 150$, $E_1/E_2 = 1$ $\ell_1/\ell_2 = 2.1$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **CINECA**, "cart" tape archive, user "miovieno", dir. 'elle21/".

Address:

`130.192.25.60/Disco2/Re150/E1_L21_R150/`
`Cineca: miovieno//cart//elle21/`

Size: 350 Gb

2.14 Data $Re_\lambda = 150$, $E_1/E_2 = 1$ $\ell_1/\ell_2 = 2.8$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A2
– **CINECA**, "cart" tape archive, user "miovieno", dir. 'elle28/".

Address:

130.192.25.60/Disco2/Re150/E1_L28_R150/
Cineca: miovieno//cart//elle28/

Size: 350 Gb
1300 time instans in 1.5 eddy turnover times for Lagrangian analysis:

Physical collocation:
– **CINECA**, SP6 scratch disk, user "lgallana".

Size: 6 Tb

2.15 Data $Re_\lambda = 250$, $E_1/E_2 = 1$ $\ell_1/\ell_2 = 2.4$

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disks A2 and A1
– **CINECA**, "cart" tape archive, user "miovieno", dir. "m250".

Address:

130.192.25.60/Disco2/Re250/L24/
130.192.25.60/Disco1/Mescolamenti_3D/Re250/
Cineca: miovieno//cart//m250/

Size: 500 Gb

2.16 Data $Re_\lambda = 150$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 1$, passive scalar $Sc = 1$

Physical collocation:
– **CINECA**, "cart" tape archive, user "miovieno", dir. "scal150"
– **PoliTO - DIMEAS**, Network disk system Lacie B → usb disk B1

Address:

Cineca: miovieno//cart//scal150/
130.192.25.166/Lacie (usb)/scalare_passivo/3Dscalar/

Size: 130 Gb

2.17 Data $Re_\lambda = 150$, $E_1/E_2 = 1$ $\ell_1/\ell_2 = 1$, passive scalar $Sc = 1$

Physical collocation:
– **CINECA**, "cart" tape archive, user "miovieno", dir. "scalunif"

Address:

Cineca: miovieno//cart//scalunif/

Size: 500 Gb (velocity fields included)

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3 Shearless mixing in presence of stable stratification

3.1 Data $Re_\lambda = 45$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 1$, $Fr = 1$

Physical collocation:
– **PoliTO - Labinf**, user "snft4"

Address:

`cclix7.polito.it  flussi_stratificati/re45/Fr1`

Size: 60 Gb

3.2 Data $Re_\lambda = 45$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 1$, $Fr = 5$

Physical collocation:
– **PoliTO - Labinf**, user "snft4"

Address:

`cclix7.polito.it  flussi_stratificati/re45/Fr5`

Size: 60 Gb

3.3 Data $Re_\lambda = 45$, $E_1/E_2 = 6,7$ $\ell_1/\ell_2 = 1$, $Fr = 10$

Physical collocation:
– **PoliTO - Labinf**, user "snft4"

Address:

`cclix7.polito.it  flussi_stratificati/re45/Fr10`

Size: 60 Gb

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4 Hydrodynamic Stability of Shear Flows

Address: `130.192.25.166/Lacie(usb)#2` and `130.192.25.166/disco_madre`

Physical Collocation: **PoliTO - DIMEAS**, Network disk system Lacie B

Total size: 4 Tb (included data at **PoliTO - Labinf**, currently under reorganizazion)

4.1 Poiseuille Channel Flow (ϕ: angle of obliquity, k: polar wavenumber)

- $Re = 500$, $\phi = 0, \pi/4, \pi/2$, symmetric and antisymmetric initial conditions, $k \in [0.05, 1000]$.
- $Re = 10000$, $\phi = 0, \pi/4, \pi/2$, symmetric and antisymmetric initial conditions, $k \in [0.05, 1000]$.

4.2 Wake Flow (ϕ: angle of obliquity, x_0: longitudinal wake section, k: polar wavenumber)

- $Re = 30$, $x_0 = 10, 50$, $\phi = 0, \pi/4, \pi/2$, symmetric and antisymmetric initial conditions, $k \in [0.1, 500]$.
- $Re = 50$, $x_0 = 10$, $\phi = 0, \pi/4, \pi/2$, symmetric and antisymmetric initial conditions, $k \in [0.1, 500]$.
- $Re = 100$, $x_0 = 10, 50$, $\phi = 0, \pi/4, \pi/2$, symmetric and antisymmetric initial conditions, $k \in [0.1, 500]$.

4.3 Blasius Boundary Layer Flow (ϕ: angle of obliquity, β: pressure gradient, k: polar wavenumber)

- $Re_{\delta^*} = 100$, $\phi = 0, \pi/4, \pi/2$, $k \in [0.02, 2]$.
- $Re_{\delta^*} = 5000$, $\phi = 0, \pi/4, \pi/2$, $k \in [0.02, 2]$.

4.4 Cross-Flow Boundary Layer (ϕ: angle of obliquity, β: pressure gradient, θ: cross-flow angle k: polar wavenumber)

- $Re_{\delta^*} = 100$, $\beta = 1, -0.1988$, $\phi = 0, \pi/4, \pi/2$, $\theta = \pi/6, \pi/4, \pi/3$, $k \in [0.02, 2]$.
- $Re_{\delta^*} = 5000$, $\beta = 1, -0.1988$, $\phi = 0, \pi/4, \pi/2$, $\theta = \pi/6, \pi/4, \pi/3$, $k \in [0.02, 2]$.

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5 Cavity flow (cavity in a channel)

5.1 $Re = 150$

Physical collocation:
– **PoliTO - DIMEAS**, Computer "dns2"

Address:

`130.192.25.86/home/michele/cavita2011/laminar/re_150_prb/`

5.2 $Re = 250$

Physical collocation:
– **PoliTO - DIMEAS**, Computer "dns2"

Address:

`130.192.25.86/home/michele/cavita2011/laminar/re_250_prb/`

5.3 $Re = 2900$

Physical collocation:
– **PoliTO - DIMEAS**, Computer "dns2"

Address:

`130.192.25.86/home/michele/cavita2011/laminar/turbulent/`

Size: 40 Gb

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6 Channel flow

Total size: 10 Gb

6.1 $Re_\tau = 180$, Les b.c.A, $y^+ = 2$ and $y^+ = 5$

Physical collocation:
– **PoliTO - DIMEAS**, CD "Les A - Re180 - uvw y^+=2, no comm."
– **PoliTO - DIMEAS**, CD "Les A - Re180 - uvw y^+=5, no comm."

6.2 $Re_\tau = 180$, Les b.c.B, $y^+ = 2$ and $y^+ = 5$

Physical collocation:
– **PoliTO - DIMEAS**, CD "Les B - Re180 - uvw y^+=2, no comm."
– **PoliTO - DIMEAS**, CD "Les B - Re180 - uvw y^+=5, no comm."

6.3 $Re_\tau = 180$, Les b.c.A, $y^+ = 2$ and $y^+ = 5$, noncommutation correction

Physical collocation:
– **PoliTO - DIMEAS**, CD "Les A - Re180 - uvw y^+=2, comm."
– **PoliTO - DIMEAS**, CD "Les A - Re180 - uvw y^+=5, comm."

6.4 $Re_\tau = 180$, Les b.c.B, $y^+ = 2$ and $y^+ = 5$, noncommutation correction

Physical collocation:
– **PoliTO - DIMEAS**, CD "Les B - Re180 - uvw y^+=2, comm."
– **PoliTO - DIMEAS**, CD "Les B - Re180 - uvw y^+=5, comm."

6.5 $Re_\tau = 590$, Les b.c.A, $y^+ = 2$ and $y^+ = 5$

Physical collocation:
– **PoliTO - DIMEAS**, CD "Les A - Re590 - uvw y^+=2, no comm."
– **PoliTO - DIMEAS**, CD "Les A - Re590 - uvw y^+=5, no comm."

6.6 $Re_\tau = 590$, Les b.c.B, $y^+ = 2$ and $y^+ = 5$

Physical collocation:
– **PoliTO - DIMEAS**, CD "Les B - Re590 - uvw y^+=2, no comm."
– **PoliTO - DIMEAS**, CD "Les B - Re590 - uvw y^+=5, no comm."

6.7 $Re_\tau = 590$, Les b.c.A, $y^+ = 2$ and $y^+ = 5$, noncommutation correction

Physical collocation:
– **PoliTO - DIMEAS**, CD "Les A - Re590 - uvw y^+=2, comm."
– **PoliTO - DIMEAS**, CD "Les A - Re590 - uvw y^+=5, comm."

6.8 $Re_\tau = 590$, Les b.c.B, $y^+ = 2$ and $y^+ = 5$, noncommutation correction

Physical collocation:
– **PoliTO - DIMEAS**, CD "Les B - Re590 - uvw y^+=2, comm."
– **PoliTO - DIMEAS**, CD "Les B - Re590 - uvw y^+=5, comm."

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7 Filtered turbulent fields

Total size: 1,3 Tb

7.1 Original data (F.Toschi)

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A1

Address:

`130.192.25.60/Disco1/Fabrizio/Toschi/`

7.2 Filter class: "cross"

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A1

Address:

`130.192.25.60/Disco1/Fabrizio/croce/`

7.3 Filter class: "sphere"

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A1

Address:

`130.192.25.60/Disco1/Fabrizio/sfera/`

7.4 Filter class: “filament”

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A1

Address:

`130.192.25.60/Disco1/Fabrizio/filamento/`

7.5 Filter class: “sheet”

Physical collocation:
– **PoliTO - DIMEAS**, Network disk system Lacie A → usb disk A1

Address:

`130.192.25.60/Disco1/Fabrizio/sheet/`